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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,258	12/14/2001	Jianping Zhang	1856-23900	5940

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EXAMINER	
PARSA, JAFAR F	
ART UNIT	**PAPER NUMBER**
1621	

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
10/023,258	Zhang et al
Examiner	**Art Unit**
J. Parsa	1621

-- The MAILING DATE of this communicati n appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *three* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Dec 14, 2001*.

2a) ☐ This action is **FINAL.** 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under ***Ex parte Quayle***, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-50* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-50* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *Dec 14, 2001* is/are a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). *5*
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schweitzer et al (WO 01/72928 English equivalent US 2003/01095590) in view of Clark et al (USPN 6156809). and further in view of Eri et al (USPN 5,116,879)

Applicants' claimed invention is directed to a method for producing hydrocarbons from syngas in a three-phase system in which the catalyst comprises solid particles, comprising:

a) providing a reactor containing the catalyst;

b) feeding the syngas into the reactor so as to generate a liquid product;

c) operating the three-phase system in a well-mixed gas flow regime, with a gas peclet number less than 0.175 and a single pass conversion between 35% and 75% and

d) removing hydrocarbons from the reactor.

Schweitzer teaches a process for synthesizing hydrocarbons by reacting a mixture comprising at least carbon monoxide and hydrogen in the presence of a catalyst usually based on a group VIII metal in a three-phase reactor in which the liquid peclet number is in the range of 0 to about 10 and highly preferably in the range from about 0.03 to about 1 with a superficial gas velocity U_g that is preferably less than 35 cm/s, to encourage gas transfer into the liquid phase and avoid too much attrition of the catalyst grains (see abstract and summary of invention).

Schweitzer discloses, while gas peclet numbers of less than 1 correspond to systems in which the gas phase is perfectly mixed or stirred. Ideal perfectly stirred systems corresponds to peclet number tending toward zero. This peclet number is equal to $Pe_g = H\,U_g\,/D_{ax}$ where H is the expansion height of the catalytic bed, U_g is the space velocity of the gas and D_{ax} is the axial dispersion coefficient of the gas phase (see page 1, paragraph 0018 through paragraph 0019).

Schweitzer teaches that the operating conditions for the Fischer-Tropsch hydrocarbon synthesis are well known. The reactor of the Schweitzer's process operates optimally at a temperature in the range of 160 ti 350 ^{0}C, preferably in the range of 200 to 300 ^{0}C., at a pressure in the range of 0.1 to 10 Mpa, preferably in the range 0.5 Mpa to 6 Mpa; the hydrogen to carbon

monoxide mole ratio is in the range 0.5 to 3 and more preferably in the range of 1.7 to 2.3 (see page 4, paragraph 0053).

The difference between Scheitzer and the claimed invention is that the instant claims require a single pass conversion between 35 % and 75 %. However, Clark teaches a method for conducting a staged process with multiple Fischer-Tropsch reactor stages arranged in series with a low carbon monoxide conversions are typically less than 70% for each reactor stage, and more preferably in a range of from about 40 to about 60 % for each stage (see col. 2, lines 47-54).

Clark teaches that overall carbon monoxide conversion of at least 90% often is being achievable (see col. 6, lines 56-61). Clark teaches a high molecular weight hydrocarbons generally about C_{11} to about C_{100} or larger are produced (see col. 13, lines 15-17).

Clark discloses that a significant advantage of low carbon monoxide conversion in at least one stage, and preferably in all stages increases the hydrogen to carbon monoxide consumption ratio and also reduces the loss of carbon to the production of carbon dioxide, resulting in a large quantity of hydrocarbon product from a given quantity of gaseous hydrocarbon feed (see col. 2, lines 58-63).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made using a multiple-stage Fischer-Tropsch reactors with a single pass conversion between 35 % to 75 % to reduce the loss of carbon to the production of carbon dioxide, resulting in a large quantity of hydrocarbon product from a given quantity of gaseous hydrocarbon feed.

The dependent claims require a gas hourly space velocity through a Fischer-Tropsch reactor to be between about 50 to about 10,000 V/hr/V. Neither Schweitzer nor Clark discloses the gaseous hourly space velocity, which is an intrinsic property. However, Eri discloses a process for hydrocarbon synthesis having a gaseous hourly space velocity preferably between 100 and 20,000 cm^3 of gas per gram of catalyst per hour. Therefore, a gaseous hourly space velocity is based on total volume of feed per hour per gram of catalyst per hour (see col. 7, lines 16-20). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a gas hourly space velocity in the range of 50 to 10,000 V/Hr/V to increase the production of hydrocarbon synthesis as taught by Eri et al.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 34-50 are rejected under 35 U.S.C. 102(b) as being anticipated by Clark et al (USPN 6,156,809).

Claims 34-50 are considered product by process claims. Clark discloses a hydrocarbon stream prepared by operating a Fischer-Tropsch reactor (see col. 13, line 16-20).

PRODUCT-BY-PROCESS CLAIMS ARE NOT LIMITED TO THE

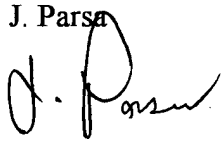
MANIPULATIONS OF THE RECITED STEPS, ONLY THE STRUCTURE IMPLIED BY THE STEPS

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Any inquiry concerning this communication from the examiner should be directed to J. Parsa, whose telephone number is (703)308-4615. The Examiner's normal work hours are Monday-Friday from 8:00 a.m. to 4:30 p.m. If Examiner is not in, please leave a message. Your call will be return as soon as possible. Any general inquiry of a general relating to the status of this application should be directed to the Group 1600 receptionist whose telephone number is (703)308-1235. The Examiner's supervisor, Johann Richter, may be reached at (703)308-4532. Communications may now be transmitted via FAX directly to group 1600. The group 1600 FAX machine number is (703)308-4556.

J. PARSA
PRIMARY EXAMINER

J. Parsa



July 7, 2003